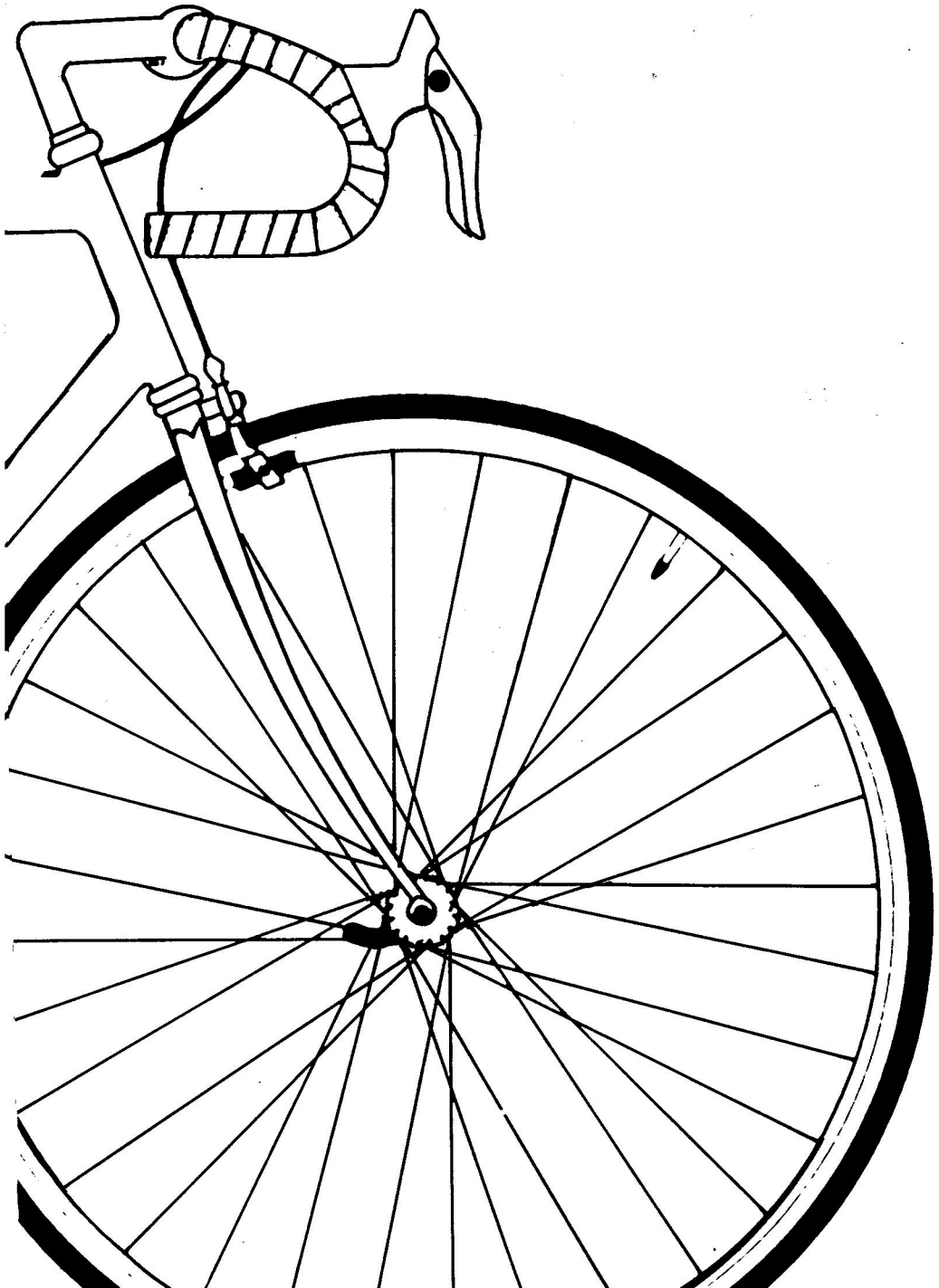
METRO-DADE
BICYCLE FACILITIES PLAN



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EXECUTIVE SUMMARY

The passage of the Intermodal Surface Transportation Efficiency Act (ISTEA) and the Clean Air Act Amendments (CAAA) have renewed incentive for planning agencies to emphasize bicycling and walking as significant components of the transportation mix. Since most bicycling occurs on roadways, planning and engineering these facilities form the backbone of the provision of safe and suitable accommodation.

The *Dade County Transportation Demand Management (TDM) & Congestion Mitigation Study* (1993) also underlines the importance of making cycling a more viable option for commuters. TDM strategies are aimed at relieving vehicular congestion, enhancing air quality and promoting energy conservation; all important factors for implementation of the concurrency component of Florida's Growth Management Act, the Federal Clean Air Act Amendments of 1990, and the Intermodal Surface Transportation Efficiency Act (ISTEA) of 1991. The same strategies are also results obtained by promoting bicycling.

Many communities are directing efforts at diverting automobile trips to other modes by diversifying the transportation system. Commuting by bicycle and other purposeful riding has been recognized as a healthful and environmentally sound form of travel which benefits both the individual user and the community as a whole. Nearly 2 out of 3 work trips, as well as those for school, shopping, recreation and personal purposes are less than 5 miles in length. This aspect alone positions the bicycle as a viable transportation alternative for many of these trips.

The overall purpose of the *Dade County Bicycle Facilities Plan* is to examine existing roadway conditions relating to bicycle travel, proposing a set of improvements of both on- and off-road facilities to incorporate into the *Transportation Improvement Plan*. The specific goals of the study were to:

- Assess the existing conditions for cyclists in Dade County, including levels of service provided by the roadway system using an objective, formulaic measure: the Roadway Condition Index (RCI).
- Evaluate specific links for improvement based on the measure of roadway suitability, connectivity between existing facilities, and location of common destinations.
- Specify future opportunities for facilities in conjunction with transportation improvement plans, and plan other required facilities to meet the needs of cyclists with a wide range of capabilities.
- Identify funding opportunities for implementing bicycle facilities.
- Recommend possible updates of the RCI to use as a measure of level-of-service for bicycle travel.
- Increase awareness about bicycles as a transportation mode in combination with other modes of transportation and to promote greater understanding of safe riding.

Methodology

The existing bicycle network consists of a system of streets and paths used by cyclists in Dade County. Since the street system already exists, and serves the community in terms of linking residential and commercial areas, bicyclists will use the street. The first step to encourage more bicycle riding as part of the transportation mix is to provide bicycle-accessible roads.

The first step in the process of analyzing the current network has been to develop an objective measure of how well the existing roadway system serves bicyclists, while recognizing the division of abilities and needs that separate adult, experienced cyclists from younger or less accomplished bicyclists.

The accessibility of the existing road system in Dade County was examined, using a set of core variables that define the acceptability or unacceptability of a roadway to bicycle users, specifically: roadway width,

speed, and average daily traffic (ADT). The use of these variables in a formula to objectively assess the suitability of the existing roadway for bicycle travel has been titled the Roadway Condition Index, or RCI.

Roadway System Analysis

For this study, data for over 2400 roadway links were collected for analysis. The data were entered on a link by link basis, the RCI formula applied, and the results plotted using a Geographic Information System. The plots were used to identify the level of service provided by the current road network, and to mark areas where improvements to the roadway could alleviate dangerous segments or barriers for roadways near common destinations, such as universities, employment centers, and recreational areas.

The RCI indicated a need for improvements for specific roadway links before bicyclists would be encouraged to ride. Because of the current lack of dedicated bicycle facilities (bike lanes and paths), combined with high speeds and volumes on major and minor arterials in the metropolitan Dade County area, almost 60% of the analyzed links were considered difficult, inadequate or hazardous to ride on.

Bicycle Facility Needs

However, not all cyclists ride comfortably in traffic, even if the traffic volume is relatively low or the roadway relatively wide. Children and occasional/adult riders may prefer more separation from traffic. The provision of dedicated, separated facilities may be one of the most important factors contributing to the safety and convenience of these cyclists. To ensure that these constituents were served, this study also examined the opportunity for off-road facilities, and recommended using selected canal and railroad right-of-ways as recreational facilities. These facilities also serve utilitarian riders if properly designed.

To develop an improvement strategy for the overall bicycle network, basic planning principles were used to analyze the continuity of the existing system, possible origins, common destinations and available accident data. A grid system of improvements was designed, (composed of on- and off-road facilities), and prioritized into a short-range and a long-term program based on the following criteria:

- Connectivity between existing facilities
- High hazard roadways near schools and employment centers
- Opportunities for major links (railroad right-of-ways, canals, etc.)
- Other high hazard roadways which can be improved for bicycle travel in conjunction with the *Long-Range Transportation Improvement Plan*

Compared to other modes requiring costly infrastructure investment, bicycle facilities are extremely cost-effective. Often, auxiliary benefits accrue along with these facilities. For example, wide outside lanes increase safety and roadway capacity for motorists; minimized center turn-lanes allow more area for travel lanes, increasing bicycle accessibility, as well as obligating automobiles drivers to maintain a safer turning speed; and recreational trails increase the overall quality of life for residents of an area.

Funding Opportunities

Funding opportunities for the future bicycle network improvements were identified, including:

- Federal Transportation Assistance Funds

  National Highway Program (NHS)
  Surface Transportation Program (STP)
  Section 402 Highway Safety Grant Program
  Congestion Management and Air Quality Improvement Program
  National Recreational Trails Fund
  Federal Transit Act
  Clean Air Act

- Federal Non-Transportation Funding Sources
  Land and Water Conservation Fund: Dept. of the Interior
  Community Development Block Grant: Dept. of Housing and Urban Development
- Local Funding Programs
  Capital Improvements Local Option Gas Tax
  Road Impact Fees

Recommended Plan

This study was not initiated to perform preliminary engineering on the entire, county-wide roadway network; but rather, to identify where needs exist and which corridors would best serve these needs. For facilities built in conjunction with future roadways, the time to make determination is during the early phase of the process, when right-of-way is being purchased. At that time, however the facility may not be constructed for a few years or longer; this long lead time requires a projection of land-use, which helps estimate the type of rider who may ride the facility. An estimate of the possible volume and speeds (observed) on the facility will also help clarify the possible types of facilities with may be required.

Programs and regulations that can help promote utilitarian cycling include:

a) travel reduction programs
b) road design regulations
c) bike racks and lockers in new parking facilities and major trip generators, such as schools, parks and retail/buisiness areas
d) shower facilities at work locations and other daily commute locations
e) high parking fees
f) media marketing campaigns to promote bicycle travel and safety
g) emphasizing bicycle route linkages to transit and commuter rail stations, and provisions for bicycles to be carried on-board

Plans for implementing bicycle projects should agree with the community's comprehensive plan and the overall goals and objectives. Dade County and the Florida Department of Transportation should implement their polices of restriping current roadway to widen the curb (or outside) lane wherever possible. For example, when the typical configuration has mutual 12-foot lanes, the interior lane(s) should be narrowed to 11 feet, (as approved by FHWA), and the outside lane widened to at least 13 feet. This typical cross-section configuration was adopted in the Dade County *Guide for the Development of Bicycle Facilities*, and does not necessarily require formal designation of bicycle facilities.

The existing roadway network in Dade County is, of the most part, inadequate for bicyclists' use, as shown by the RCI. By examining the possible origin areas and likely destinations of bicyclists, a grid system of improvements was designed, composed of both on-road and off-road facilities. These improvements were prioritized based on their ability to connect existing facilities, high-hazard roads near major generators, and opportunities for recrational/greenway paths. The result is a facilities plan to enhance the existing Dade County bicycle network.

The completed network map is shown on in Figure 13. These corridors should be integrated with some type of bicycle facility. This should not, however, limit the scope or intention to which Metro-Dade County is concerned with in accommodating bicyclists. Where at all possible, bicycle-friendly designs should be integrated into any new, reconstruction, resurfacing or restriping project. Therefore every transportation project should be given review as to its bicycle accessibility.

INTRODUCTION

Within any urban area, the construction of bicycle facilities becomes increasingly more important as population density increases. Dade County's population has surpassed 2 million, and is projected to climb between 2.5 to 3 million by the year 2010. Planners recognize that mass transit will become more important; and Dade County has made a commitment to mass transit with the existing Metrorail alignment and future extensions into highly urbanized areas. With this study, Metro-Dade is focusing upon another mode choice: bicycling, by attempting to meet the transportation needs for those individuals choosing the bicycle for mobility, as well as to identify possible larger-scale recreational possibilities.

Dade County's last real efforts to accommodate bicycle use came in the 1970's "Decade of Progress"; gas shortages forced transportation engineers to reconsider the importance of private automobiles. During this time bicycle paths were main focus. Bicycles weren't considered roadway vehicles as they are today. Also, the majority of bicycle riders were children; today more than half of the cycling population are adults. Many of them depend on these vehicles as primary means of transportation for economic reasons.

Facility type consideration has also changed. Safety of separated bicycle paths has been proven to be questionable by transportation researchers; one study for the National Highways Traffic Administration showed that bicyclists are 2.6 times more likely to crash on a pathway than on a road. The Florida Dept. of Transportation (FDOT), as with many transportation professionals consider on-road treatments to be substantially safer. Not all bike paths are hazardous, but these facilities cannot safely meet the needs of all user types; and should not be the only facility type considered when planning for bikeways.

Adding wide outside lanes or paved shoulders to roadways has become a recommended safety design for our roadways. Understanding that right-of-way is at a premium cost, these treatments will reduce overall costs to better accommodate bicycling, as opposed to separate, off-road treatments. Therefore, they should be considered a minimum design standard, **not an additional treatment**. Without proper facilities, use will may not be apparent -- demand depends on design. Since the goal of transportation circulation is to provide ease of mobility safely to all users of the system, all roadways should be thought of as moving people, rather than moving motor vehicles.

PURPOSE OF PLAN

This study examines the adequacy of present infrastructure serving cyclists, using a set of variables that define conditions of a roadway to accommodate bicycling. This Roadway Condition Index (RCI) is similar to the Level-of-Service (LOS) used to determine roadway conditions/capacity for motor vehicles, although the RCI method actually defines a level of "dis-utility" that affects a cyclist's route choice.

A secondary objective of this report is to increase awareness about bicycles as a transportation mode, thus promoting a greater understanding of safe riding conditions in combining bicycles with other modes of transportation. The overall goals and concerns for this study include:

- Assessing the existing conditions for bicyclists in Dade County, including levels of service provided by the roadway system using a Road Condition Index (RCI).
- Identifying future opportunities for bicycle facilities in conjunction with transportation improvement plans and other projects to help meet the needs/wide range of capabilities of cyclists.
- Identifying specific links for improvement, based on the measure of roadway suitability, connectivity between existing facilities and location of common destinations.
- Identifying possible funding opportunities for implementing bicycle facilities.